

REMARKS

Entry of the foregoing amendments and claims prior to the examination of this application is respectfully requested. The amendments present terminology used in the claims and the claims recite the method and apparatus more in accordance with conventional U.S. practice. No new matter has been added. Every amendment and all claim limitations are clearly set forth in the original disclosure and claims.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attachment is captioned VERSION WITH MARKINGS TO SHOW CHANGES MADE.

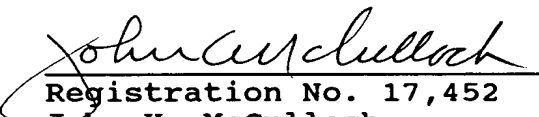
It is believed that this application now is in condition for examination and allowance. Further and favorable action is requested.

The Office is authorized to charge or refund any fee deficiency or excess to Deposit Account No. 12-0755.

Respectfully submitted,

Matthias Brunner et al

By their attorney,


Registration No. 17,452
John K. McCulloch
5291 Colony Drive North
Saginaw, Michigan 48603
989-799-5300

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Substitute the attached one page abstract for the abstract originally filed.

Page 1, before line 1, insert the following paragraph:

-- This application is a continuation of application Serial No. 09/204,430, filed December 3, 1998, now abandoned. --

The paragraph beginning at line 1 of page 1 has been amended as follows:

-- The invention relates to a method and to apparatus for testing a substrate[,] in which a particle beam is directed onto the substrate and emitted secondary particles are detected with a detector and then evaluated.

BACKGROUND OF THE INVENTION --

The paragraph beginning at line 10 of page 3 has been amended as follows:

-- The object of the invention is to provide a method and apparatus [according to the preambles to Claims 1, 11 and 13 by which] for improving the testing of substrates having a large surface area [is further improved]. [According to the invention this object is achieved by the characterising features of claims 1, 11 and 13.]

SUMMARY OF THE INVENTION --

The paragraph beginning at line 14 of page 3 has been amended as follows:

-- With ever-increasing deflection angles the detector signal also changes in so far as the location of the secondary particles emitted on the substrate relative to the position of

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the detector [detection] has an increasing influence on the number of secondary particles reaching the detector. In other words, the detector signal varies to a large extent with the location of the emitted secondary particles relative to the position of the detector. --

The paragraph beginning at line 20 of page 3 and ending at 10 of page 4 has been amended as follows:

-- In order to achieve a uniform signal evaluation over the entire area, therefore, the location of the secondary particles emitted on the substrate relative to the position of the detector is taken into account during testing. In this case there are in principle two variants:

1. Means are provided which guide the secondary electrons from a location or site on the substrate to the detector and are controlled in such a way that a detector signal which is independent of the location is set at the detector.

2. The location or site of the emitted secondary electrons is not taken into account until the evaluation, i.e. in a comparison with the desired reference signal, in which case either the detector signals are compared with location-dependent desired signals or the detector signals are corrected as a function of the location and then compared with a desired signal. --

The paragraph beginning at line 11 of page 4 has been cancelled in its entirety and replaced with the following:

-- THE DRAWING

The single drawing figure is a schematic diagram of

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apparatus for performing the testing method according to the invention. --

The paragraph beginning at line 14 of page 4 has been amended as follows:

-- THE PREFERRED EMBODIMENT

The apparatus shown in the drawing consists essentially of a particle beam source 1, particularly an electron beam source for producing a particle beam which traverses a path designated by the arrow 2, an optical system 3 for focusing the particle beam, a deflecting arrangement 4 and a detector 5. --

The paragraph beginning at line 1 of page 5 has been amended as follows:

-- The particle beam [2] is directed onto a selected site of a substrate 8 to be examined, secondary particles [9] being emitted along a second path shown by the arrow 9, at least some of the emitted secondary particles being [of which at least are] detected by the detector 5. In the detector 5 the detected secondary particles [9] are converted into an electrical detector signal 10 which is supplied to an arrangement 11 for evaluation of the detector signal where the detector signal 10 is compared with a desired or reference signal. --

The paragraph beginning at line 7 of page 5 has been amended as follows:

-- In order to improve the testing process it is provided according to the invention that the location or site of th secondary particles [9] emitted on the substrate 8 relative

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to the position of the detector 5 is taken into account during testing. In this case two variants are conceivable in principle which can be used separately or can also be advantageously combined with one another. --

The paragraph beginning at line 16 of page 5 and ending at line 4 of page 6 has been amended as follows:

-- The underlying idea of this method is that in the case of two different locations x_1 and x_2 on the substrate 8 different detector signals are produced if the other conditions, i.e. in particular the number of emitted secondary particles, are identical. This is based on the fact that the emitted particles are emitted in different directions on the substrate 8 and it is therefore necessary to guide the secondary electrons to the detector. For this extraction electrodes are provided which lead to satisfactory results for small scan areas of a few square centimetres. With large deflections, however, markedly different detector signals can occur, although the object examined on the substrate functions in a completely identifiable manner and only its position on the substrate leads to a reduced value detector signal which possibly no longer reaches the necessary desired value. --

The paragraph beginning at line 12 of page 6 has been amended as follows:

-- The apparatus illustrated in the drawing therefore has a control arrangement 13 which is connected to the deflecting arrangement 4 and the means 12 for guiding the secondary particles. In this way a synchronised control of the

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means 12 for guiding the secondary particles is ensured as a function of the location or site to which the particle beam is directed. --

The paragraph beginning at line 1 of page 7 has been amended as follows:

-- The second variant according to the invention is based upon the fact that the dependence of the detector signal upon the location of the emitted secondary particles is not taken into consideration until the evaluation of the detector signal. Thus it would be conceivable that the detector signals determined in each case are compared with respective location-dependent desired or reference signals. As an alternative to this, the location-dependent detector signal could first of all be corrected to a location-independent signal in order then to be compared with a desired or reference signal. --

The paragraph beginning at line 1 of page 8 has been amended as follows:

-- As the size of the substrate to be tested increases, scanning solely by beam deflection, even with the above-mentioned corrections and provisions for the secondary electron detection, can no longer be carried out. However, a combination of beam deflection with a mechanical displacement of the substrate then allows a test. The substrate 8 is retained for this purpose on a support table 14 which is displaceable at least in a plane perpendicular to the particle beam. The properties of the secondary particle detection can be optimised if the deflection of the particle beam takes place preferably in

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one direction, whilst the substrate is displaced mechanically in
the direction perpendicular thereto. --

Cancel claims 1-14.

Add claims 15-30.

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